Arizona Department of Health Services

Arizona Overdose Fatality Review Committee

Overdose Deaths occurred January 1 – December 31, 2019

Annual Report

November 9, 2021

Submitted to:
The Honorable Douglas A. Ducey, Governor, State of Arizona
The Honorable Karen Fann, President, Arizona State Senate
The Honorable Russell Bowers, Speaker, Arizona State House of Representatives
This report is provided as required by A.R.S §36.198

Prepared by:
Arizona Department of Health Services, Bureau of Chronic Disease and Health Promotions, Office of Injury and Violence Prevention

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Executive Summary

Prescription and illicit opioids, like fentanyl, are addictive and responsible for an increasing number of deaths in Arizona.[1] This rise reflects a growing problem across the nation and overdose deaths are the leading cause of preventable injury death.[2,3]

The Overdose Fatality Review Committees (OFRC) were modeled after Child Fatality Review teams.[4] By assembling multiagency, interdisciplinary teams, which include healthcare providers, emergency responders, medical examiners, law enforcement, public health, social services and others, state and local overdose fatality review teams determine the Relative Contribution to Fatality (RCF) for each overdose case and what measures could have been in place to alter the outcome.[5] Overdose fatality reviews involved a series of confidential individual death reviews by a multidisciplinary team to effectively identify system gaps and innovative community-specific overdose prevention and intervention strategies.

In 2020, federal funding was secured to enable the establishment and support of local county teams in the following counties: Cochise, Coconino, Gila, Mohave, Navajo, Pima, Pinal, Yavapai and Yuma. All these counties actively reviewed or were in the process of establishing rosters to actively review death records for overdose deaths occurring in 2019. OFRCs make prevention recommendations for implementations that strengthen collaborations, communication, and system processes among entities to affect long-term impacts on public health outcomes. The OFRC findings inform strategic planning and agency activities related to overdose prevention at the state and local level.

The five most common prevention recommendation themes were: increase drug education and awareness of polysubstance use, access to mental health services, access to substance use disorder treatment, assist with negative life events, and naloxone access and education. Increasing drug education and awareness of polysubstance use includes communicating the risks associated with concurrent use of prescription medications, illicit substances, and/or alcohol. Increasing access to mental health services includes recommendations to increase access to mental health care, and to include increasing community awareness of available services. Access to substance use disorder treatment includes recommendations to increase access to both inpatient and outpatient substance use disorder treatment (e.g., medication assisted treatment, behavioral health services) and to include increasing community awareness of available services. Assisting with negative life events includes recommendations to improve or assist with unstable housing, lack of transportation, unemployment or a traumatic event (e.g., physical or sexual assault, loss of a friend or family member). Naloxone access and education includes recommendations around methods of risk mitigation for emergency medical staff, healthcare professionals, and community members, and removal of barriers and obstacles for naloxone distribution.

Table of Contents

INTRODUCTION

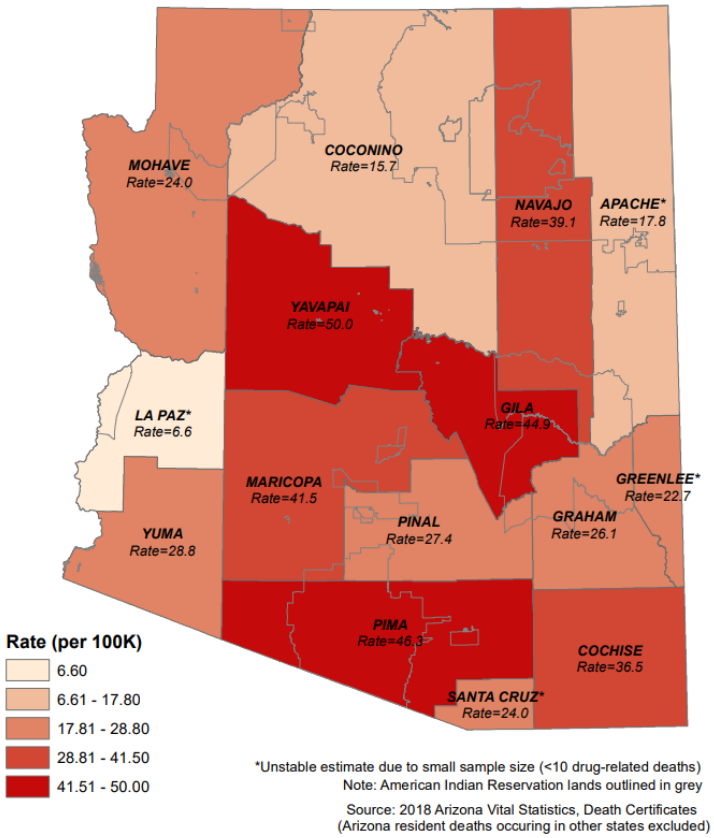
In the United States there were an estimated 70,630 drug overdose deaths in 2019, a 4.6% decrease from 2018.[6] The age adjusted rate in 2019 (21.6 per 100,000) was higher than in 2018 (20.7).[6] Age-adjusting the rates ensures that differences in deaths from one year to the next are not due to differences in the age distribution of the populations being compared. Synthetic opioids (other than methadone) are the largest driver of opioid-related drug overdose deaths (51.5% of all drug overdose deaths).[6]

In Arizona the number and age adjusted rate of drug overdose deaths increased from 2018 [1,766 (25.0 per 100,000)] to 2019 [2,000* (39.8 per 100,000)].[7] Rates of overdose deaths in 2019 varied by county (Figure 1). *Sum rounded to nearest tens unit (due to addend of county count less than 10).

Drug overdoses are classified as injuries due to poisonings. As injuries, overdoses are predictable and preventable through system level changes that modify the environment, enforcement and education.[8]

Governor Doug Ducey declared a statewide opioid epidemic health emergency in 2017, and the OFRC was established under A.R.S. §36-198.[9] The primary purpose was to develop data-driven recommendations for reducing preventable drug overdose deaths.

Figure 1. 2019 Drug Overdose Deaths by County of Death (Arizona Rate = 39.8 per 100,000)



METHODS

Identification of cases for review by the state and local OFRCs was accomplished by locating death certificates of Arizona residents who had drugs (prescription or illicit) listed as their primary cause of death. When a person dies, information is entered into the Arizona Department of Health Services (ADHS) Office of Vital Records-Database Application for Vital Events (DAVE).[10] All Arizona deaths are registered through DAVE which provides the ability to record death events completely and accurately, thereby enhancing the birth and death certification process. All deaths between January 1, 2019 and December 31, 2019, with a drug listed as the primary cause of death were identified.

The state OFRC matched identified death certificates to emergency department and inpatient admissions using the ADHS Hospital Discharge Database (HDD)[11] to identify drug-related hospital admissions that occurred in the year preceding death. Per A.R.S. § 36-198, "on request of the chairperson of the drug overdose fatality review team or a local team and as necessary to carry out the team's duties, the chairperson shall be provided, within five days excluding weekends and holidays, with access to information and records regarding a drug overdose fatality that is being reviewed by the team or regarding the person who overdosed on drugs." The state and local OFRCs request records from medical facilities, behavioral health agencies, the Controlled Substances Prescription Monitoring Program (CSPMP), law enforcement and emergency medical services, and others.

All records received by the state and local OFRCs were reviewed to determine if additional records were needed to analyze deaths and contributing factors (e.g. substance use, social, psychological and medical factors). A pre-review of the records was performed prior to review by the entire OFRC. Information obtained was subsequently abstracted using an internal abstraction database.

Although rare, when no information was received from potential sources the OFRCs used available data contained in the death certificate or non-Tribal agency records to establish causation. Some local OFRCs are exploring the use of family interviews to supplement records review. Deaths with insufficient data were determined to be unknown.

APPROACH

The state OFRC reviewed a random sample of approximately 10% of all cases in counties without a local OFRC (Apache, Graham, Maricopa, Santa Cruz, Yuma) and fatalities whose county of residence were unknown. The state OFRC also assisted other local OFRCs and developed a statewide data collection system for comparison across jurisdictions to build a comprehensive picture of how these deaths may be prevented. Local OFRCs reviewed some or all of cases residing/occurring in their county (selection criteria varied by local OFRC).

A total of 112 cases (of the 2019 deaths) were randomly selected for state OFRC review and are included. A total of 117 cases were reviewed by six local OFRCs (Coconino, Gila, Navajo, Pinal, Pima, and Yavapai counties). Subsequent to data quality review, 93 cases (from four local OFRCs) were combined with the state OFRC cases for analysis (see Appendix 1). A total of 205 cases are included in a brief summary within this report.

OFRC RECOMMENDATIONS

- Remove barriers to evidence-based care for persons with substance use disorder (SUD). This includes removing prior authorization and step therapy for medications to treat opioid use disorder, continuing federal flexibilities for take-home medication for opioid treatment programs and continuing telehealth options for persons to begin medication for opioid use disorder. Consider incentivizing primary care providers to provide mediations used to treat opioid use disorder.

- Enforcement of mental health and substance use disorder parity laws to increase access to mental health services and substance use disorder treatment. Review the most commonly used billing codes for substance use disorder treatment and mental health services to ensure coverage.

- Continue and expand distribution of naloxone from all healthcare locations, particularly emergency departments. Amend existing naloxone laws so that the distribution of pre-packaged naloxone kits can be dispensed by any person in Arizona, including all staff within healthcare facilities. Additionally, amend Senate Bill 1087 (55th Legislature, 1st Regular Session, 2021) to remove mandatory reporting of naloxone distribution and add clarifying language that no record-keeping is required to distribute naloxone from healthcare settings.

- Strengthen Good Samaritan laws by boosting awareness of the importance of bystander naloxone use and other harm reduction strategies including the use of fentanyl test strips.

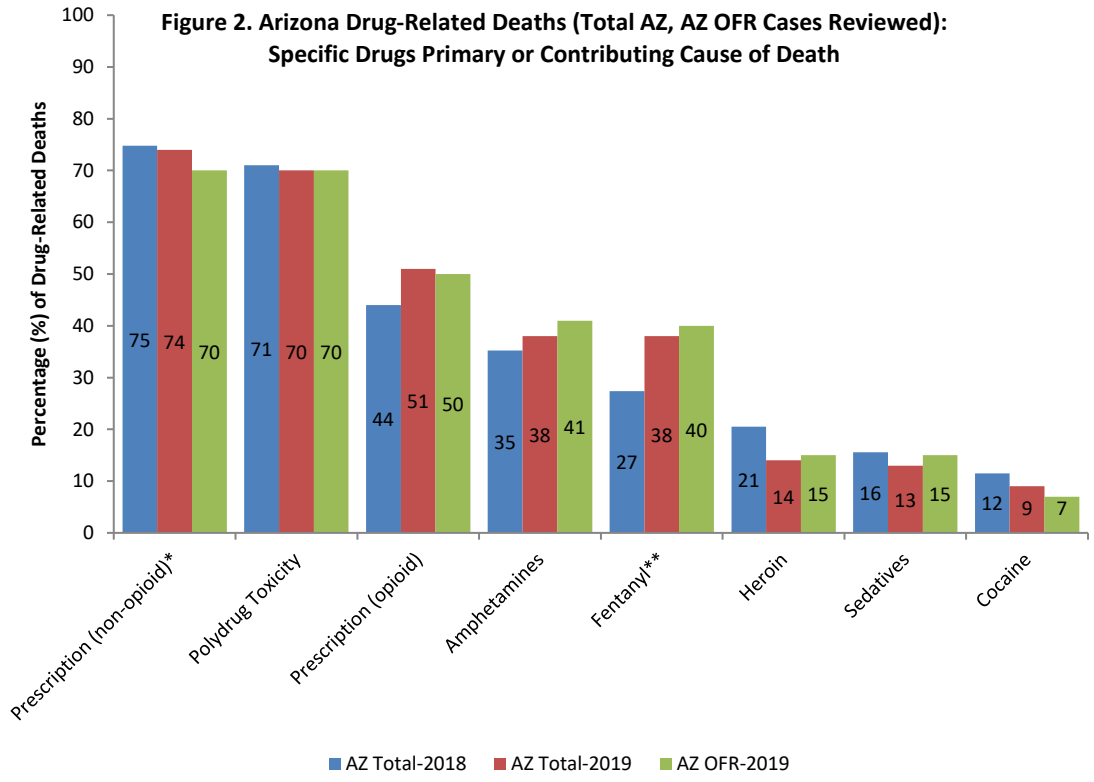
FINDINGS

ALL ARIZONA DRUG OVERDOSE DEATHS

Drug Types

A primary cause of death is the final disease, injury, or complication directly causing death. A contributing cause of death is the disease or injury that initiated the chain of morbid events that led directly and inevitably to death. An analysis on specific drugs noted as the a) primary cause of death or b) contributing cause was completed. Polydrug toxicity was noted as the primary or contributing cause for the majority (70%) of all Arizona drug overdose deaths (2019). Prescription medications (any non-opioid (74%) or opioid prescription (51%)) were the most common drugs noted as the primary and/or contributing cause of death, followed by fentanyl (38%), amphetamines (38%), heroin (14%), sedatives (13%), and cocaine (9%) (Figure 2). Fentanyl, noted as the primary or contributing cause of death, increased most significantly from 2018 (27%) to 2019 (38%). Drug types noted as the primary or contributory cause of death was similar among cases reviewed by the OFRC. Note: Percentages add to more than 100% because each death can have more than one contributing cause of death.

Figure 2. Arizona Drug-Related Deaths (Total AZ, AZ OFR Cases Reviewed): Specific Drugs Primary or Contributing Cause of Death



*Prescription (non-opioid) drugs include antidepressants, corticosteroids, gabapentin, etc. **There is no specific ICD-10 code for fentanyl; estimates approximated using cause of death text

Demographics (see Figures in Appendix 2)

Age

The distribution of drug overdose deaths by age is significantly different from the Arizona population; skewed towards younger age groups. The most common age groups overall for drug overdose deaths were 25-34 years (21%), 35-44 years (21%) and 45-54 years (19%). Results varied by drug involved.

Sex

The distribution of drug overdose deaths by sex is significantly different from the Arizona population; skewed towards more males. Drug overdose deaths were more common overall among males (69%) than females (30%). This difference was more pronounced for some specific drug types including cocaine (81% males), heroin (80% males), fentanyl (75%), and amphetamines (74% males).

Education

The distribution of drug overdose deaths by education is significantly different from the Arizona population; skewed towards lesser education levels. The most common education level overall for drug overdose deaths was a high school diploma (40%), some College (26%), or less than a high school diploma (20%), but results varied by drug involved. Drug overdose deaths due to heroin or amphetamines were more likely to have less than a high school diploma (25% and 23%, respectively).

Marital Status

The distribution of drug overdose deaths by marital status is significantly different from the Arizona population; consisting of more single/never married and previously married. The most common marital status overall for drug overdose deaths was single/never married (52%) or previously married (28%), but results varied by drug involved. Drug overdose deaths due to fentanyl or heroin were more likely to be single/never married (65%).

Race

The distribution of drug overdose deaths by race is not significantly different from the Arizona population. The most common race overall for drug overdose deaths was White (83%). Drug overdose deaths due to cocaine were about two times more likely to be African American (12%) compared to all drug overdose deaths overall (7%). Drug overdose deaths due to heroin were about three times less likely to be African American (2%) compared to all drug overdose deaths overall (7%).

Ethnicity

The percent of drug overdose deaths that were Hispanic (26%) was lower than the Arizona population (32%). Drug overdose deaths due to fentanyl or cocaine were about 1.3 times more likely to be Hispanic (35%) compared to all drug overdose deaths overall (26%).

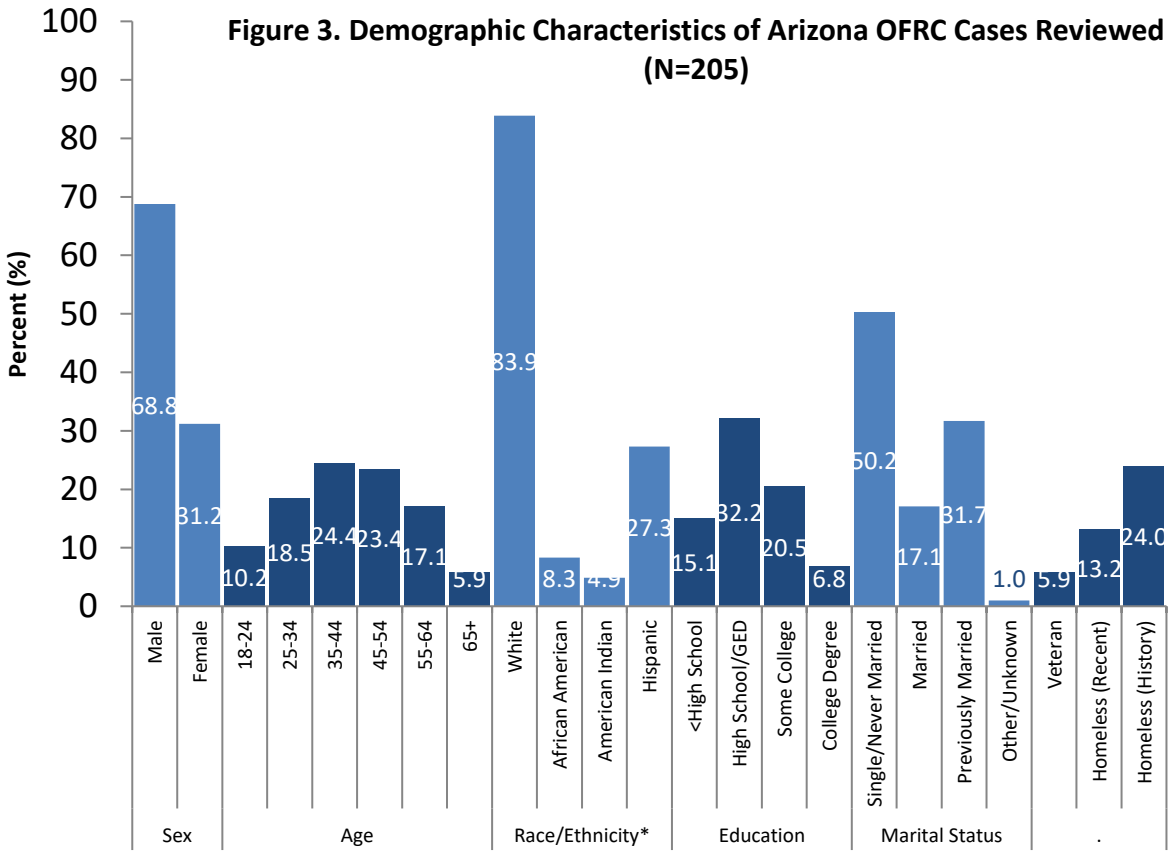
2019 STATE OVERDOSE FATALITY REVIEW

From June 2020 to December 2020, the state OFRC reviewed a total of 112 overdose deaths. From June 2020 to May 2021, local OFRC teams reviewed a total of 117 overdose deaths (93 were included in the analysis presented). A database was designed and used to consistently abstract specific variables of interest across all OFRCs for all cases related to demographics, circumstances, contributing factors, comorbidities, stressors, medical history and utilization and prevention recommendations. The level of review detail allowed for extensive analysis of overdose deaths and compiled aggregate data to help inform data-driven recommendations to reduce preventable overdose deaths.

There are numerous factors that indicate potential issues with substance abuse. Early intervention when the factors are initially identified is extremely important to prevent potential overdose (Appendix 3).

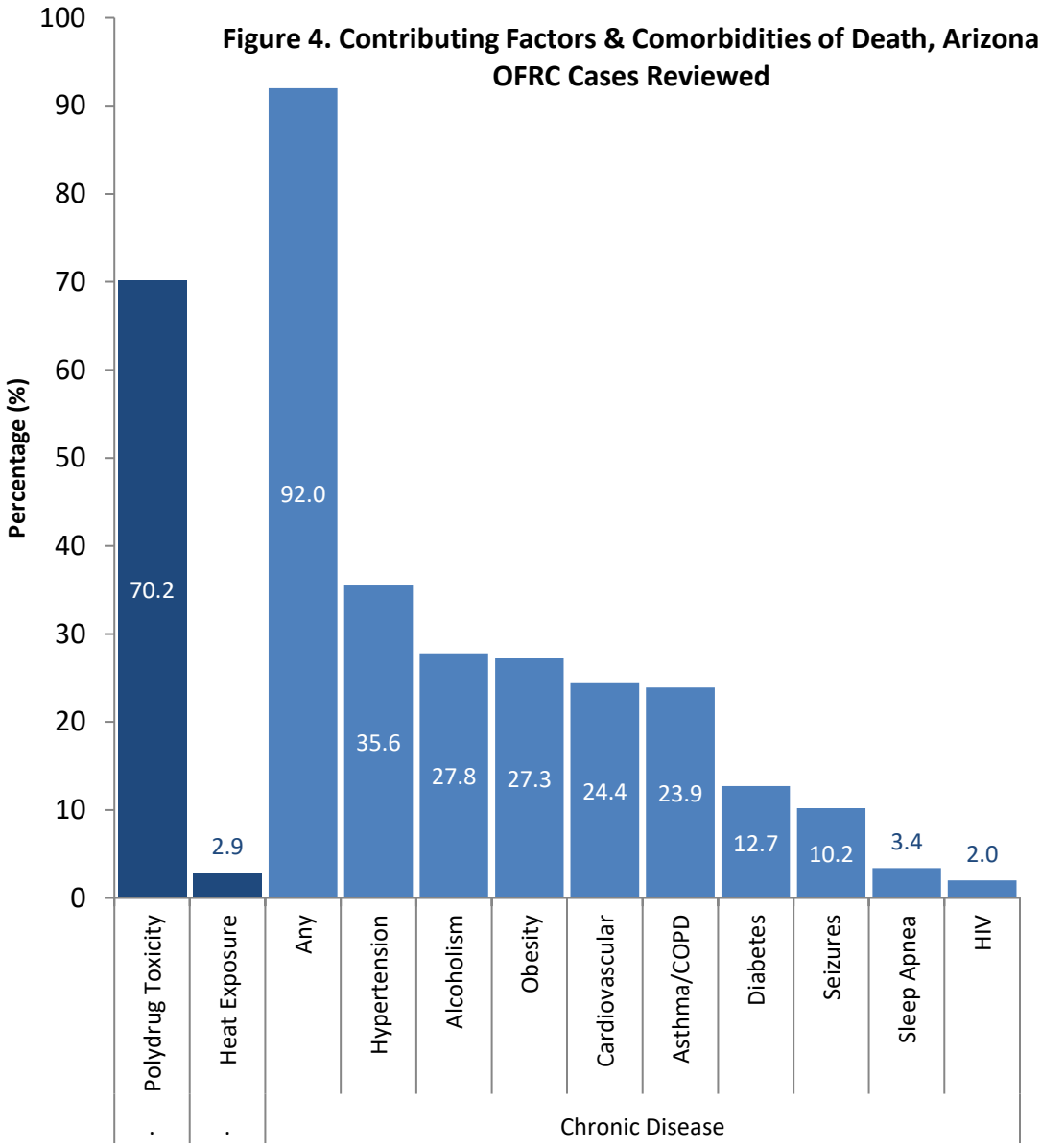
Demographics (Figure 3)

OFRC cases were not significantly different from all Arizona overdose deaths with regards to sex, race, ethnicity, age, marital status or prior military service. OFRC cases had significantly lower education compared with all Arizona overdose deaths. Unstable housing was common among cases reviewed by the OFRC as evidenced by recent (13%) or lifetime (24%) history of homelessness.



Contributing Factors & Comorbidities (Figure 4)

Polydrug toxicity was a contributing factor in the majority (70%) of OFRC cases reviewed and among all Arizona drug overdose deaths (70%). At least one underlying comorbidity was present in the majority (92%) of OFRC cases reviewed. The most common underlying conditions were hypertension (36%), alcoholism (28%), obesity (27%), cardiovascular disease (24%), and asthma/COPD (24%).

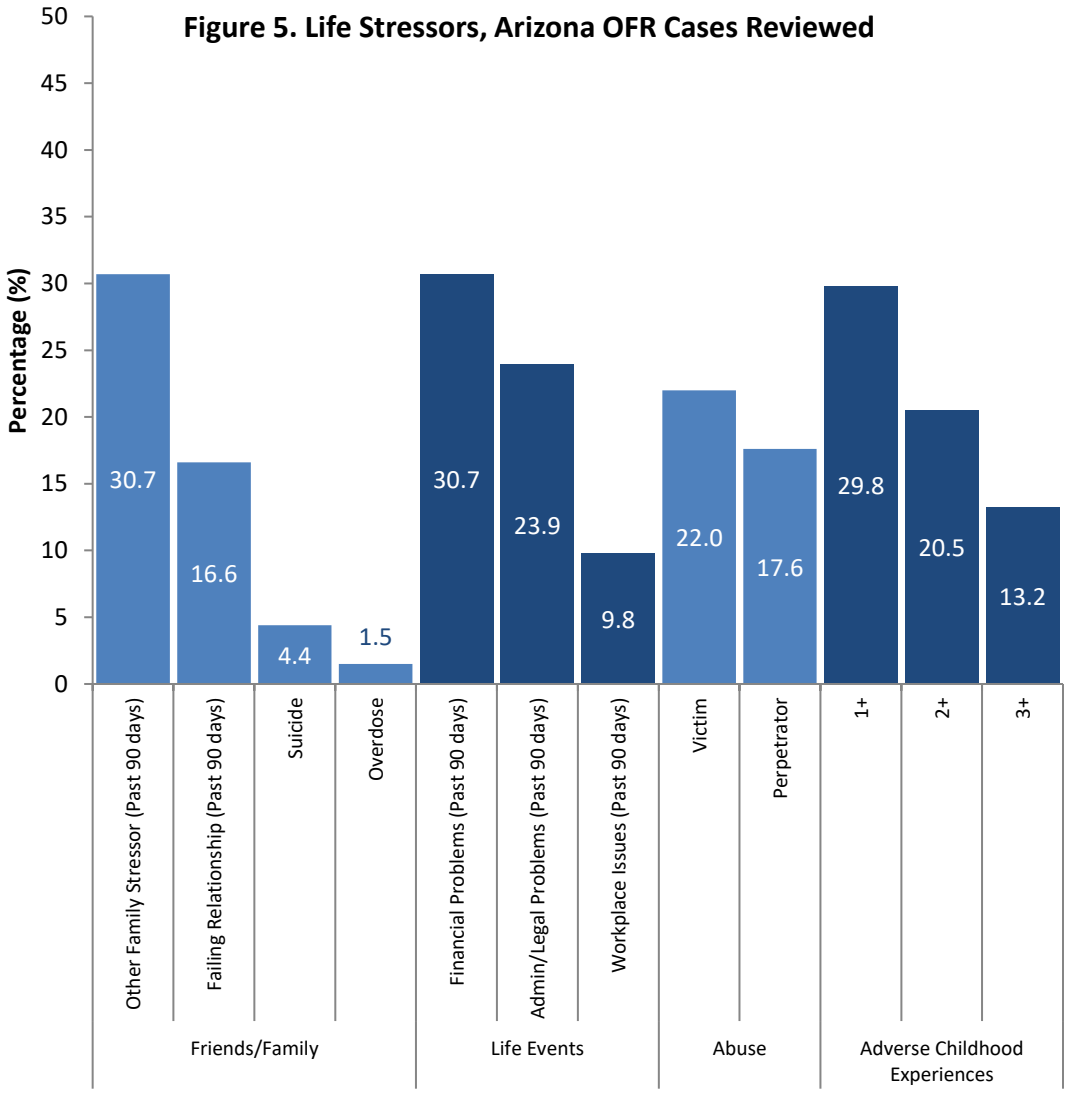


*Any comorbid conditions also include other diseases and conditions prevalence in less than 5% of cases reviewed (e.g., disability, hepatitis, limited independence, unspecified) not specifically parsed out or presented above

Stressors (Figure 5)

Among OFRC cases the most common life stressors documented included financial problems (31%), administrative/legal problems (24%), family stressor (e.g., illness, death; 31%), a failing relationship (17%) or a workplace issue (10%). Nearly 1 in 4 (22%) OFRC cases reviewed were the victim of abuse at some point in their life. Eighteen percent were the perpetrator of abuse.

Thirty percent of OFRC cases reviewed had at least one adverse childhood experience (ACE, 0-17 years of age) which included abuse (physical, emotional, sexual), neglect (emotional, physical), intimate partner violence, mother treated violently, household substance misuse, household mental illness, parental divorce/separation and incarcerated family member. Twenty-one percent of OFRC cases experienced ≥ 2 ACEs and 13% experienced ≥ 3 ACEs. State and local OFRC access to certain medical records, psychosocial records, past clinical history, and other records varies. The prevalence of OFR characteristics presented is based on known information.

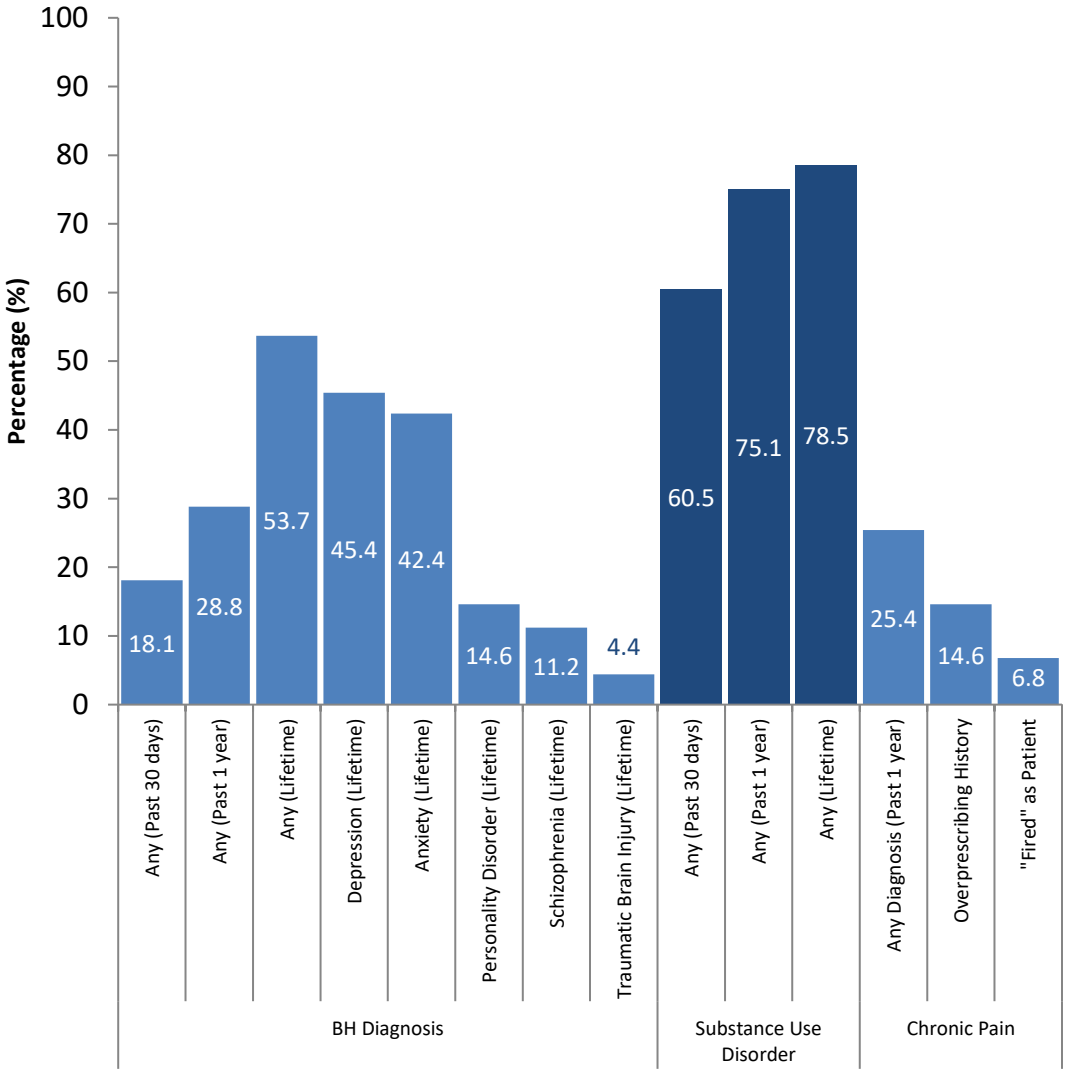


Behavioral Health History (Figure 6)

Among OFRC cases, a behavioral health diagnosis was documented preceding their death in the prior month (18%), prior year (29%), or ever in their lifetime (54%). The most common lifetime behavioral health diagnoses were depression (45%) and anxiety (42%).

Among OFRC cases, substance use disorders were identified preceding death in the prior month (61%), year (75%), or lifetime (79%). A chronic pain diagnosis was documented in the year prior to death among 25% of OFRC cases. Other lifetime indicators of possible prescription misuse were identified among OFRC cases, including a history of overprescribing (15%) or being "fired" as a patient (7%).

Figure 6. Behavioral Health History, Arizona OFR Cases Reviewed

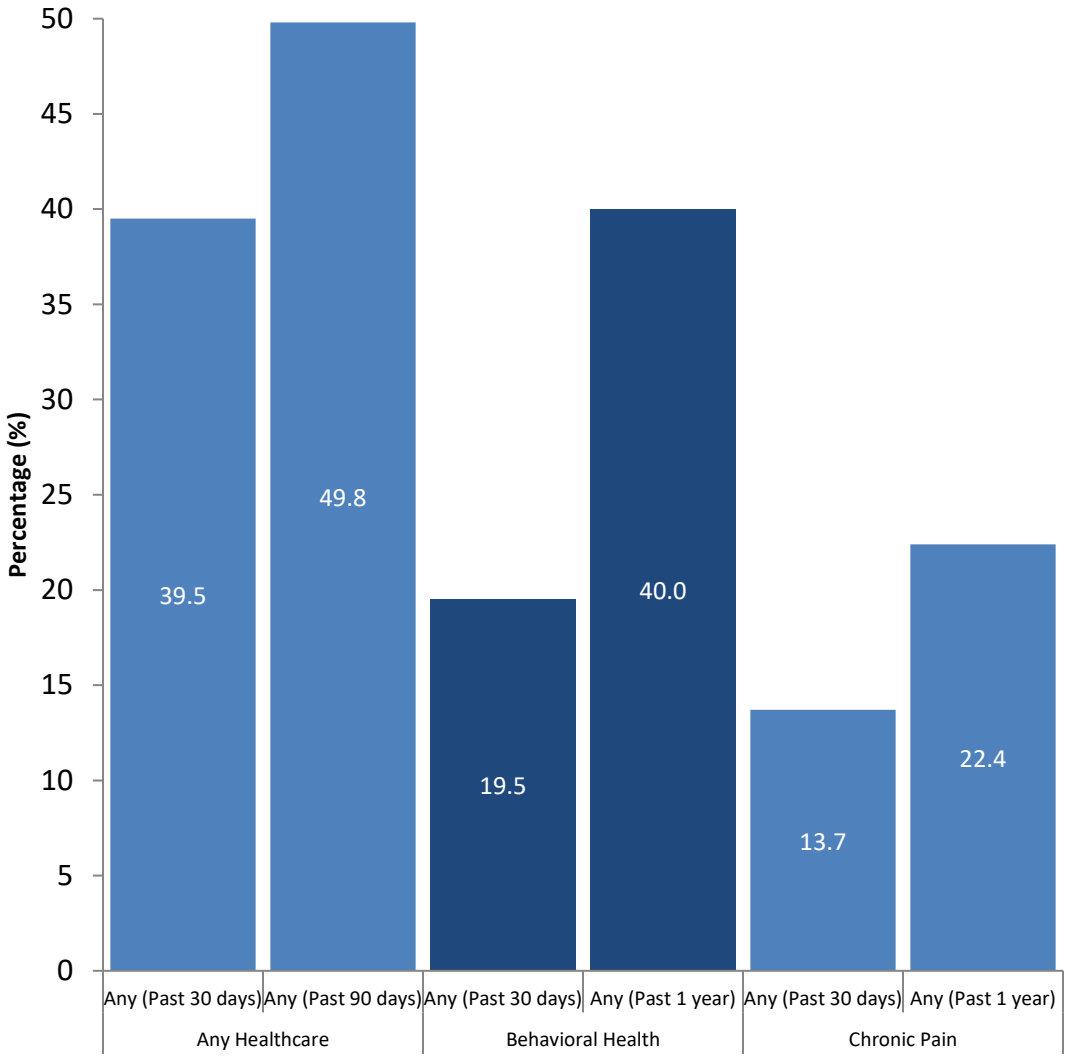


Healthcare Utilization (Figure 7)

Approximately 2 in 5 (40%) OFRC cases reviewed had a healthcare encounter noted in the month prior to death, and 1 in 2 (50%) had a healthcare encounter noted in the 90 days prior to death. More specifically, OFRC cases had documented encounters for behavioral health in the month (20%) or year (40%) prior to death, and chronic pain in the month (14%) or year (22%) prior to death.

Healthcare utilization may be confounded by insurance status. Among OFRC cases reviewed, insurance status and type was not always known or captured. Anecdotally, OFRC members are aware that a large number of case were likely uninsured, underinsured, or on Medicaid (Arizona Health Care Cost Containment System).

Figure 7. Healthcare Utilization History, Arizona OFR Cases Reviewed

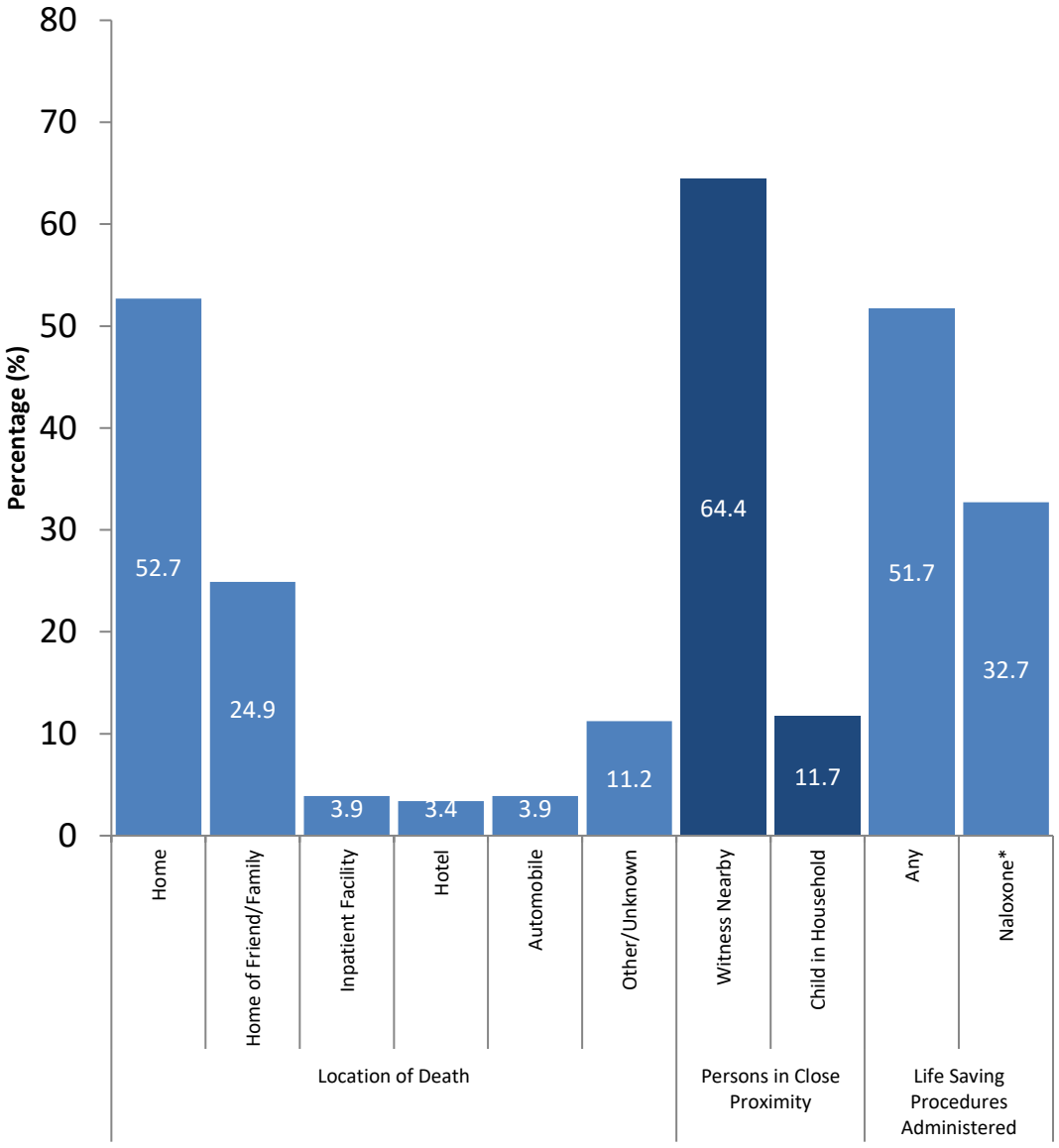


Circumstances (Figure 8)

Three of four OFRC cases died at their home or the home of a family member/friend (53% or 25%, respectively), and 64% of cases indicated someone was present or had recently been present around the time of their death. A child (not always related) was in the home around the time of death for 12% of OFRC cases.

Administration of lifesaving procedures was documented for 52% of OFRC cases; naloxone was administered to 33% of these cases.

Figure 8. Circumstances of Death, Arizona OFR Cases Reviewed



*Naloxone was specifically administered to 35.8% of opioid-related overdoses

Preventability of OFRC Cases Reviewed

The OFR process in Arizona is grounded in the principles of public health and focused on the prevention of all drug overdose deaths. The OFRCs considered prevention measures if there was a *reasonable* opportunity that something could have been done (by an individual, community or system) at some point in a person's life to prevent the death. Prevention measures for an individual case were via consensus by OFRCs after discussing and reviewing all available data. The total number of prevention measures identified (593 total mentions) for 205 individual OFRC cases varied (range 1 to 5). Prevention measures are broadly grouped into themes: primary (preventing substance abuse), secondary (preventing ongoing substance abuse), and tertiary (preventing fatal overdoses). Local OFRCs also identified prevention measures not shown, but they were utilized to inform local decision-making and summarized for the state OFRC to inform the development of the recommendations included in this annual report.

All prevention recommendations for OFRC cases reviewed are shown in Figure 9 and the most common prevention recommendations within each broad category are described below.

Primary Prevention (Preventing Substance Abuse)

- Increase access to mental health services (11%)
- Assist with negative life events: any (i.e., unstable housing, unemployment, traumatic event) (10%)
- ACEs in real-time (for kids) and delayed (for adults) (6%)

Secondary Prevention (Preventing Ongoing Substance Abuse)

- Access to substance use disorder (SUD) treatment: expand inpatient/outpatient treatment (e.g., MAT) (11%)
- Access to substance use disorder (SUD) treatment: education/coordination of treatment among incarcerated populations (6%)
- Access to substance use disorder (SUD) treatment: general (5%)

Tertiary Prevention (Preventing Fatal Overdose)

- Increase drug education/awareness: polysubstance use (12%)
- Increase naloxone access and education (10%)
- Increase drug education/awareness: current trends of street drugs (6%)

The five most common prevention recommendation themes were: Increase drug education and awareness of polysubstance use (69 mentions); Increase access to mental health services (67 mentions); Increase access to substance use disorder treatment (expanding inpatient, outpatient, and medically assisted treatment (67 mentions); Assist with negative life events (62 mentions); and Increase naloxone access and education (53 mentions). Increasing drug education and awareness of polysubstance use includes communicating the risks associated with concurrent use of prescription medications, illicit substances, and/or alcohol. Increasing access to mental health services includes recommendations to increase access to mental health care and to include increasing community awareness of available services. Access to substance use disorder treatment includes recommendations to increase access to both inpatient and outpatient substance use disorder treatment (e.g., medication assisted treatment, behavioral health services) and to include increasing community awareness of available services. Assisting with negative life events includes recommendations to improve or assist with unstable housing,

lack of transportation, unemployment or a traumatic event (e.g., physical or sexual assault, loss of a friend or family member). Naloxone access and education includes recommendations around methods of risk mitigation for emergency medical staff, healthcare professionals, and community members, and removal of barriers and obstacles for naloxone distribution.

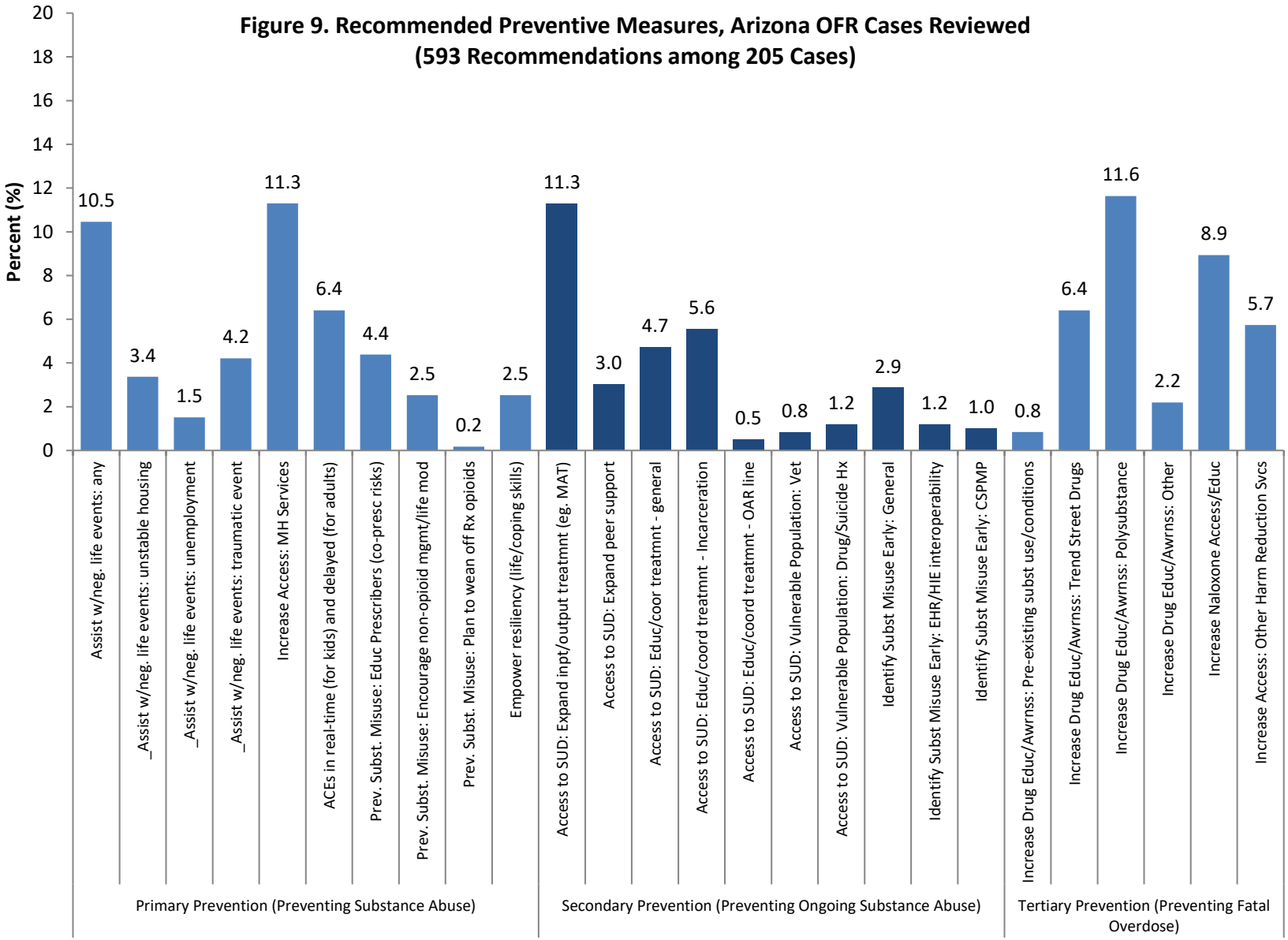


Figure 9. Recommended Preventive Measures, Arizona OFR Cases Reviewed
(593 Recommendations among 205 Cases)
Percent (%)
20
18
16
14
12
10
8
6
4
2
0
10.5
3.4
1.5
4.2
11.3
6.4
4.4
2.5
0.2
2.5
11.3
3.0
4.7
5.6
0.5
0.8
1.2
2.9
1.2
1.0
0.8
6.4
11.6
2.2
8.9
5.7
Assist w/neg. life events: any
_Assist w/neg. life events: unstable housing
_Assist w/neg. life events: unemployment
_Assist w/neg. life events: traumatic event
Increase Access: MH Services
ACEs in real-time (for kids) and delayed (for adults)
Prev. Subst. Misuse: Educ Prescribers (co-presc risks)
Prev. Subst. Misuse: Encourage non-opioid mgmt/life mod
Prev. Subst. Misuse: Plan to wean off Rx opioids
Empower resiliency (life/coping skills)
Access to SUD: Expand inpt/output treatmnt (eg. MAT)
Access to SUD: Expand peer support
Access to SUD: Educ/coor treatmnt - general
Access to SUD: Educ/coord treatmnt - Incarceration
Access to SUD: Educ/coord treatmnt - OAR line
Access to SUD: Vulnerable Population: Vet
Access to SUD: Vulnerable Population: Drug/Suicide Hx
Identify Subst Misuse Early: General
Identify Subst Misuse Early: EHR/HIE interoperability
Identify Subst Misuse Early: CSPMP
Increase Drug Educ/Awrnss: Pre-existing subst use/conditions
Increase Drug Educ/Awrnss: Trend Street Drugs
Increase Drug Educ/Awrnss: Polysubstance
Increase Drug Educ/Awrnss: Other
Increase Naloxone Access/Educ
Increase Access: Other Harm Reduction Svcs
Primary Prevention (Preventing Substance Abuse)
Secondary Prevention (Preventing Ongoing Substance Abuse)
Tertiary Prevention (Preventing Fatal Overdose)

Limitations to the Overdose Fatality Review Process

One of the limitations to the fatality review process is the time interval between the initiation of substance use and death. This makes it difficult to identify earlier, perhaps more effective, interventions. Arizona has 22 federally recognized Tribes who are not required to comply with this mandate. This lack of access to certain medical records, psychosocial records, past clinical history, and other records is a barrier when reviewing the circumstances of a death and if it was preventable, which is the foundation of OFR. The prevalence of OFR characteristics presented is based on known information.

Next Steps to Enhancing Overdose Fatality Review Process

The state OFRC random sample of 10% review of overdose deaths (for counties without a local OFRC) and the six local OFRC review of overdose deaths in their counties further identified the need for standardized processes and protocols for requesting and reviewing records and formulating an effective methodology to summarize data for these cases compared with all Arizona drug overdose deaths. It is critical that additional local OFRCs be established to conduct and prepare an annual analysis on the incidence and causes of drug overdose deaths in their communities and provide data-driven recommendations for legislation and public policy. It is also critical that established local OFRCs data quality procedures be improved to help inform the ongoing review and data submission of local OFRC case data for inclusion with state OFRC cases.

As directed by A.R.S.§36-198, the ADHS Office of Injury and Violence Prevention developed standards and protocols for local drug overdose fatality review teams and provide on-going training, support, and technical assistance to these teams. The ADHS Office of Injury and Violence Prevention developed a detailed policy and procedure manual for local OFRCs that include an updated prevention measures worksheet for recommendations within the categories of healthcare, criminal justice, crisis response, community and substance use disorder.

Membership

The 2019 state OFRC was a multidisciplinary team of professionals including subject matter experts in the following: forensic medicine (medical examiners), law enforcement, emergency medical services, residential treatment program, public health, correctional health, toxicology, personal experiences and representatives from Arizona's Tribal nations.

- Daniel Brooks, MD-Chairman-Association Representing Hospitals Representative
- Shannon Scheel-Co-Chairman-County Sheriff or Sheriff's Designee (pop ≥500,000)
- Brent Burgett-Professional Emergency Management System Association Representative
- Christina Mrukowicz-Association of County Health Officers (proxy)
- David Robertson, DO-State Department of Corrections (proxy)
- Elisha Franklin, MBA-Chicanos Por La Cause (public member)
- Gail Bradley, MD-Arizona Department of Health Services Bureau of Emergency Medical Services and Trauma System
- Hazel Alvarenga-Arizona Health Care Cost Containment System (proxy)
- Heston Silbert-Department of Public Safety
- Jacqueline Kurth-Arizona Department of Health Services (proxy)
- Jeffrey Johnston, MD-Medical Examiner-Metropolitan Forensic Pathologist
- Kevin Ray-Office of Attorney General
- Krista Forster-Administrative Office of the Courts
- Lawrence Czarnecki, DO-Medical Examiner - Forensic Pathologist
- Lisa Villarroel, MD, MPH-Arizona Department of Health Services
- Marcy Flanagan-Association of County Health Officers Representative
- Maria Fuentes-Governor's Office of Youth, Faith and Family
- Nidhi Krishna, MS-Arizona Health Care Cost Containment System Representative
- Richard Rowe, MD-State Department of Corrections
- Rita M. Leal-Public Member
- Sarah Coles, MD-Statewide Association Physicians Representative
- Satya Sarma, MD-Arizona Health Care Cost Containment System (proxy)
- Sophia Horn-Office of Attorney General (proxy)
- Susan Alameda-Governor's Office of Youth, Faith, and Family (proxy)
- Teresa Aseret-Manygoats, MPA-Arizona Department of Health Services
- Tony Mapp-Department of Public Safety (proxy)
- William Risen-County Sheriff or Sheriff's Designee (pop ≤500,000)

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Appendix 1. Local OFRC Data Quality Review Process

Background

Local OFR teams are required to report drug overdose fatality data to ADHS using the OFR data collection tool created by ADHS. State and local OFR teams are required to conduct and prepare an annual analysis on the incidence and causes of drug overdose fatalities during the preceding year and provide data-driven recommendations for legislation and public policy. Annual analyses can also mobilize development of protocols for drug overdose investigations and the public's role in prevention.

Methods

All OFR tools submitted by local teams were reviewed by the opioid overdose epidemiologist for completeness and to identify data quality issues. After the initial review, local teams were contacted about possible revisions needed for inclusion into the combined dataset (the All Counties Data Tool (ACDT)). There was then a final review and determination of whether resubmitted tools could be accepted and added to the ACDT.

Data quality metrics were established and reviewed for all local OFR tools submitted. These included the number of cases reviewed, whether the cases matched 2019 drug-related cases from death certificates provided, the number of cases with blank or unknown entries, whether variables had been added or deleted, the number of variables missing data, and whether standard responses were used.

Findings

- Local OFR tools were often missing evidence of education and age of first drug use data.
- Some local teams overused "unknown" responses resulting in incomplete data collected.
- Some local teams included of cases of overdose deaths that did not match 2019 provided death certificates for various reasons (e.g., case from different years, out of state resident, vaguely or non-drug-related. Further research was necessary to identify and match these cases to 2019 death certificates.

Conclusions

- After initial submission, 3 of 6 local OFRs were asked to revise and resubmit their data tools; 1 county resubmitted (Table S1).
- Four of the 6 local OFRs who submitted their tools were included in the ACDT (including 93 overdose death cases)
- Two common reasons for rejection of data tools were:
    - Incomplete data (too many "unknown" or blank responses)
    - Cases reviewed that could not be matched to 2019 death certificates for drug-related causes.
- Upon development of the ACDT, all OFR cases were matched with 2019 death certificates.
- Suggested improvements for local team OFR tools include:
    - Education information can be obtained from death certificates
    - Confirm names and death certificate number are included
    - Discontinue use of age of first drug use
    - Ensure tool is capturing "evidence of…" to limit unknown responses
    - Regularly communicate challenges throughout the OFR process

Table S1. Local OFR Data Tool – Data Quality Review								
County	**Cases**	**Death Certificate Review**	**Missing Data for Each Case**		**Missing Data for Each Variable**		**Variables Added**	**Variables Deleted**
			0-4 items	**5+ items**	**>20% cases**	**>50% cases**		
1*	6	Fail-incorrect years	0	6	Yes-most cases missing data	Yes-most cases missing data	No	No
2	15	Pass	15	0	No	Yes-education; age at first use	No	No
3*	18	Fail-unknown	0	18	Yes-most cases missing data	Yes-most cases missing data	No	No
4	19	Pass	16	3	Yes-marital status	Yes-education; age at first use	Yes-ok	No
5	24	Pass	24	0	Yes-naloxone admin	Yes-age at first use	No	No
6	35	Pass	34	1	yes-lifetime substance use disorder	Yes-education; age at first use	No	No

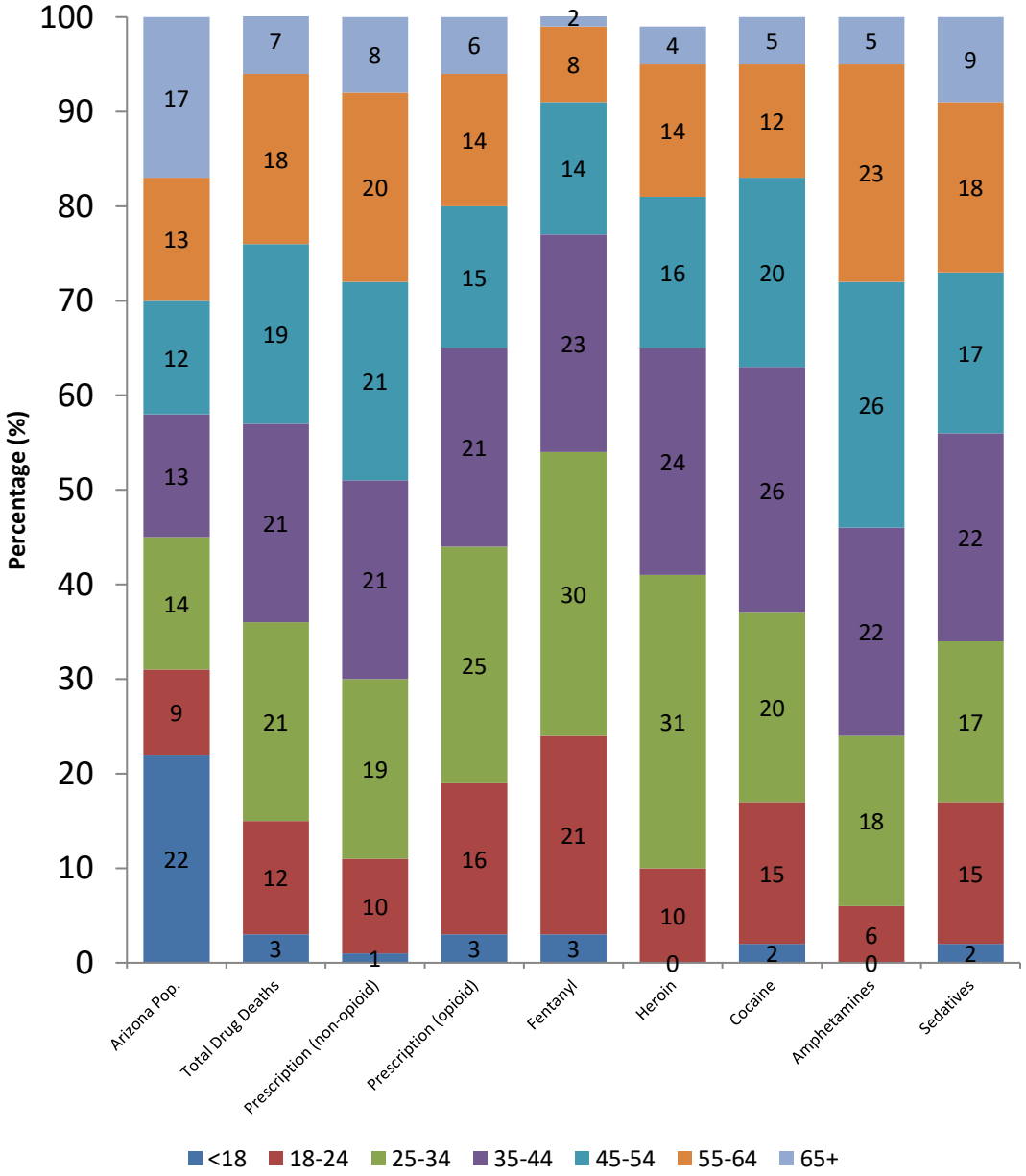
*Did not pass data quality review; was not included in the All Counties Data Tool (ACDT)

Appendix 2. All Arizona Drug Overdose Deaths - Demographics

Age (Figure A1)

The distribution of drug overdose deaths by age is significantly different from the Arizona population; skewed towards younger age groups. The most common age groups overall for drug overdose deaths were 25-34 years (21%), 35-44 years (21%) and 45-54 years (19%). Results varied by drug involved.

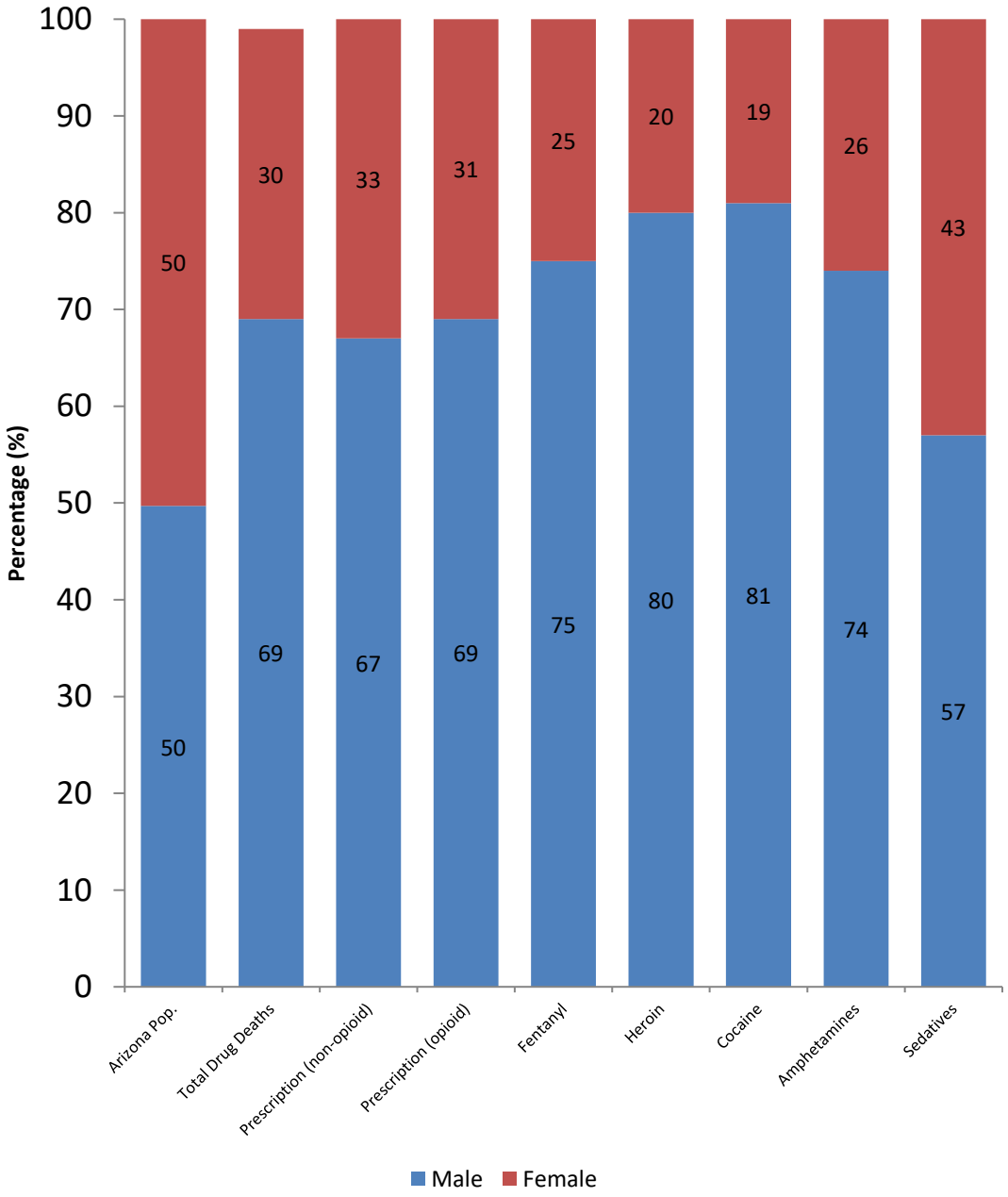
Figure A1. Arizona Drug-Related Deaths: Age Group (Years) by Drug



Sex (Figure A2)

The distribution of drug overdose deaths by sex is significantly different from the Arizona population; skewed towards more males. Drug overdose deaths were more common overall among males (69%) than females (30%). This difference was more pronounced for some specific drug types including cocaine (81% males), heroin (80% males), fentanyl (75%), and amphetamines (74% males).

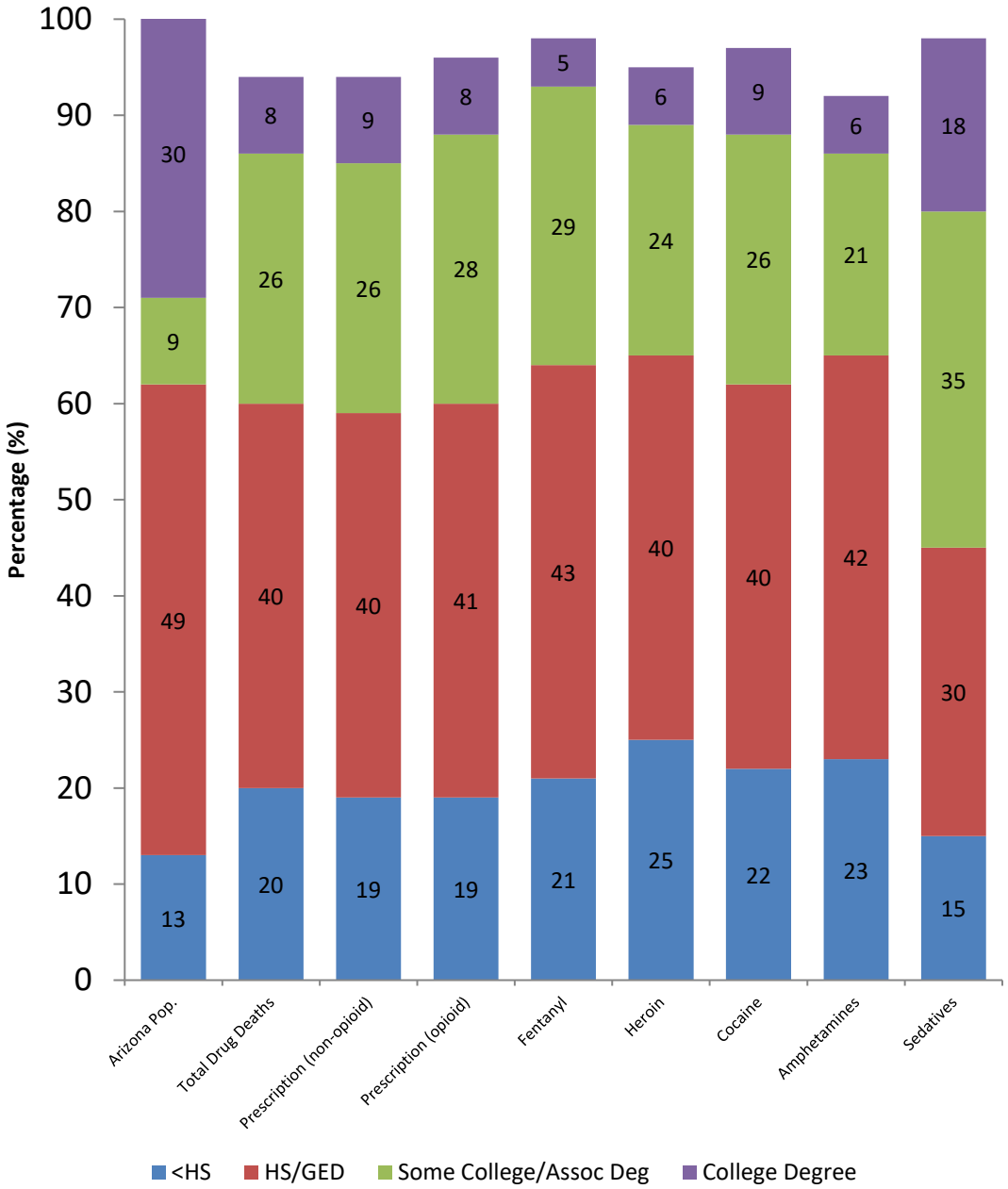
Figure A2. Arizona Drug-Related Deaths: Sex by Drug



Education (Figure A3)

The distribution of drug overdose deaths by education is significantly different from the Arizona population; skewed towards lesser education levels. The most common education level overall for drug overdose deaths was a high school diploma (40%), some college (26%), or less than a high school diploma (20%), but results varied by drug involved. Drug overdose deaths due to heroin or amphetamines were more likely to have less than a high school diploma (25% and 23%, respectively).

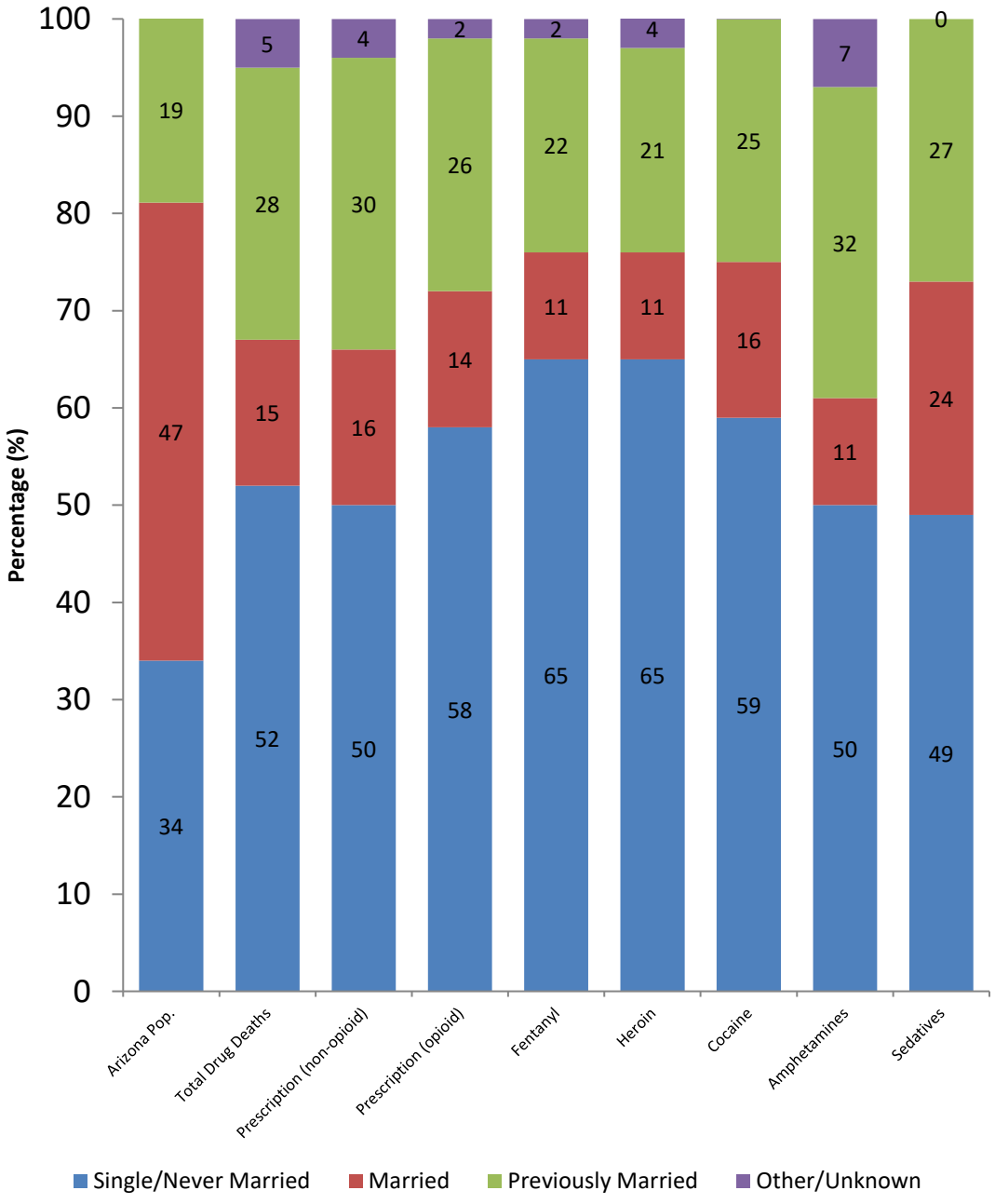
Figure A3. Arizona Drug-Related Deaths: Education by Drug



Marital Status (Figure A4)

The distribution of drug overdose deaths by marital status is significantly different from the Arizona population; consisting of more single/never married and previously married. The most common marital status overall for drug overdose deaths was single/never married (52%) or previously married (28%), but results varied by drug involved. Drug overdose deaths due to fentanyl or heroin were more likely to be single/never married (65%).

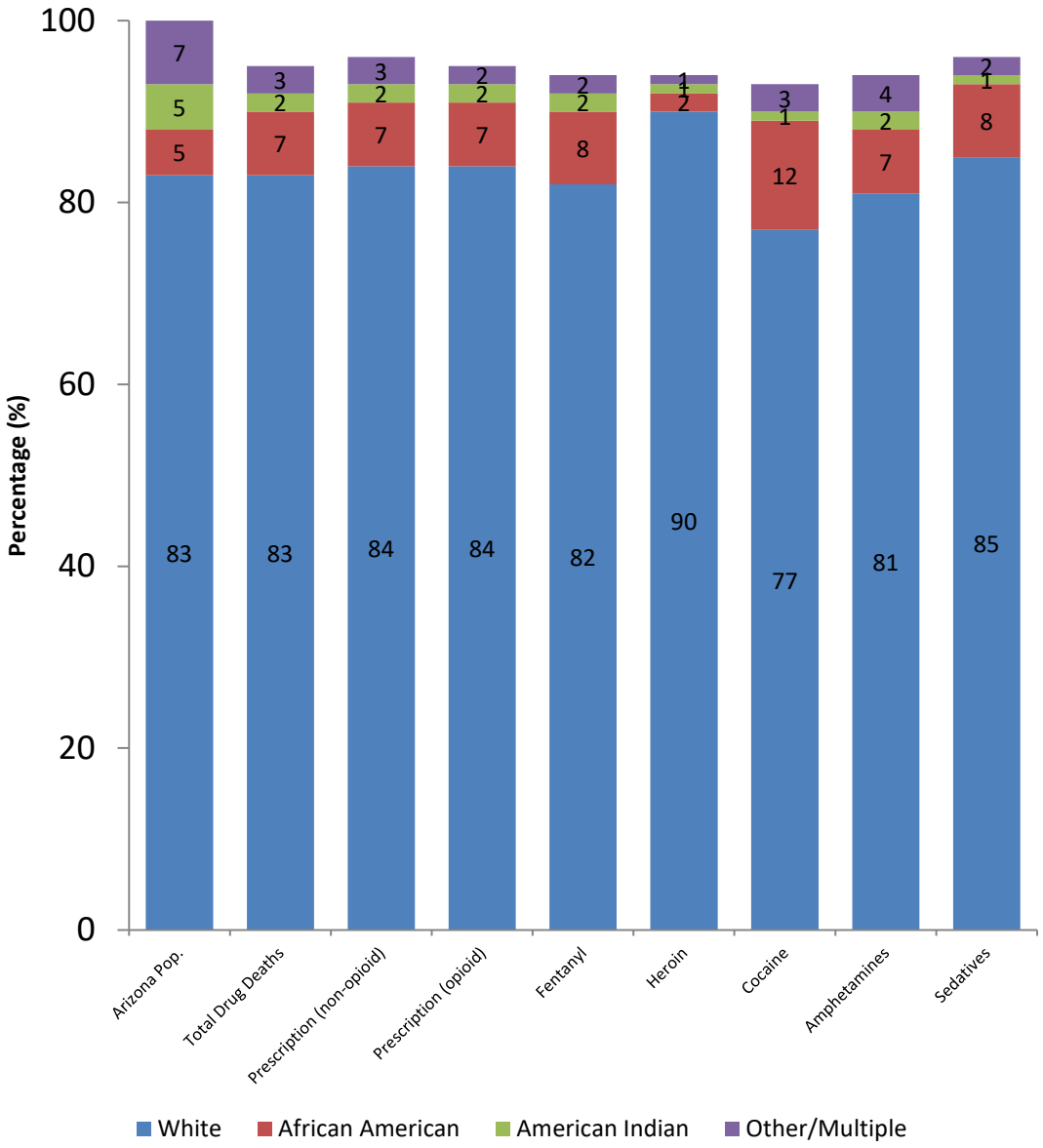
Figure A4. Arizona Drug-Related Deaths: Marital Status by Drug



Race (Figure A5)

The distribution of drug overdose deaths by race is not significantly different from the Arizona population. The most common race overall for drug overdose deaths was White (83%). Drug overdose deaths due to cocaine were about two times more likely to be African American (12%) compared to all drug overdose deaths overall (7%). Drug overdose deaths due to heroin were about three times less likely to be African American (2%) compared to all drug overdose deaths overall (7%).

Figure A5. Arizona Drug-Related Deaths: Race by Drug

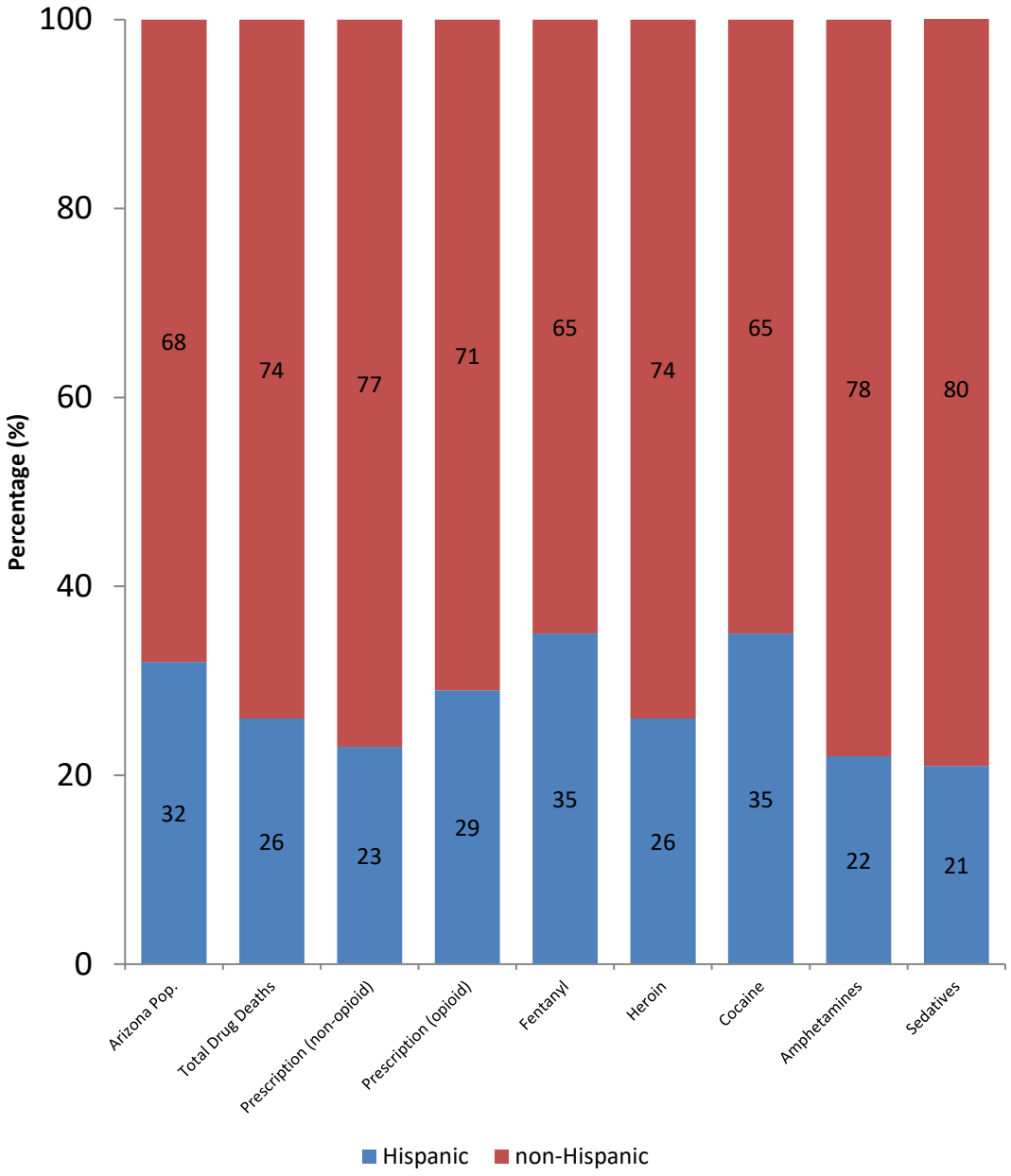


*Percent does not add to 100% due to rounding and unknown race data

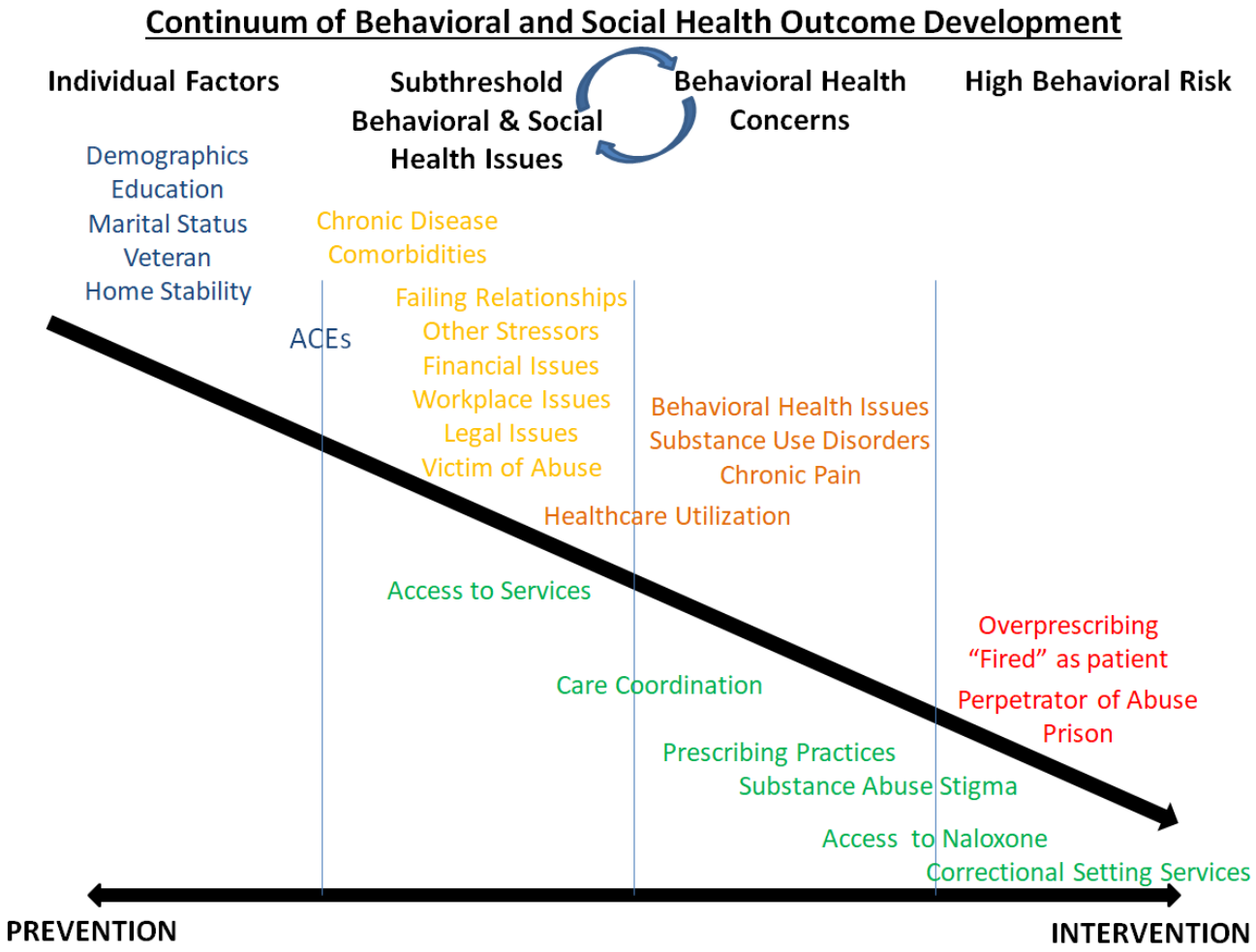
Ethnicity (Figure A6)

The percent of drug overdose deaths that were Hispanic (26%) was lower than the Arizona population (32%). Drug overdose deaths due to fentanyl or cocaine were about 1.3 times more likely to be Hispanic (35%) compared to all drug overdose deaths overall (26%).

Figure A6. Arizona Drug-Related Deaths: Ethnicity by Drug



Appendix 3.


Continuum of Behavioral and Social Health Outcome Development
Individual Factors
Subthreshold Behavioral & Social Health Issues
Behavioral Health Concerns
High Behavioral Risk
Demographics
Education
Marital Status
Veteran
Home Stability
Chronic Disease
Comorbidities
ACEs
Failing Relationships
Other Stressors
Financial Issues
Workplace Issues
Legal Issues
Victim of Abuse
Behavioral Health Issues
Substance Use Disorders
Chronic Pain
Healthcare Utilization
Access to Services
Overprescribing
"Fired" as patient
Care Coordination
Perpetrator of Abuse
Prison
Prescribing Practices
Substance Abuse Stigma
Access to Naloxone
Correctional Setting Services
PREVENTION
INTERVENTION